

What is claimed is:

[Claim 1] 1. A radial shaft seal comprising:

a sealing ring comprising a support housing and a shell of elastomer material surrounding at least partially the support housing;

wherein the sealing ring comprises a sealing lip having a sealing edge or sealing surface configured to rest seal-tightly against a rotary machine part;

wherein the sealing lip has a first conical surface at a first side facing a medium to be sealed and a second conical surface at a second side facing a surrounding atmosphere, wherein the first and second conical surfaces adjoin the sealing lip;

wherein between the rotary machine part and the first conical surface a first contact surface angle is formed and wherein between the rotary machine part and the second conical surface a second contact surface angle is formed;

wherein the first contact surface angle is adjusted to be between approximately 0 degrees and approximately 30 degrees and the second contact surface angle is adjusted to be between approximately 30 degrees up to approximately 70 degrees.

[Claim 2] 2. The radial shaft seal according to claim 1, wherein the sealing lip is a monolithic part of the shell.

[Claim 3] 3. The radial shaft seal according to claim 1, wherein the sealing lip and the shell are comprised of different materials, respectively.

[Claim 4] 4. The radial shaft seal according to claim 1, further comprising a support ring against which support ring the sealing ring rests, wherein the support ring is arranged on a side of the sealing ring facing the surrounding atmosphere.

[Claim 5] 5. The radial shaft seal according to claim 4, wherein the support ring has an L-shaped cross-section.

[Claim 6] 6. The radial shaft seal according to claim 4, wherein the support ring comprises an axial part resting against the sealing lip.

[Claim 7] 7. The radial shaft seal according to claim 6, wherein the axial part of the support ring has a conical support surface tapering in a direction toward the medium to be sealed.

[Claim 8] 8. The radial shaft seal according to claim 7, wherein the conical support surface has an angle matching the first contact surface angle.

[Claim 9] 9. The radial shaft seal according to claim 6, wherein the support ring comprises a radial part, wherein the support housing and the shell rest against the radial part of the support ring.

[Claim 10] 10. The radial shaft seal according to claim 9, wherein the radial part of the support ring extends essentially across an entire radial width of the sealing ring.

[Claim 11] 11. The radial shaft seal according to claim 1, wherein at least one of the first conical surface and the second conical surface has at least one conveying structure.

[Claim 12] 12. The radial shaft seal according to claim 11, wherein the at least one conveying structure is selected from the group consisting of grooves, wave-shaped profiles, and ribs.

[Claim 13] 13. The radial shaft seal according to claim 11, wherein the conveying structure on the second conical surface is oriented opposite to the conveying structure of the first conical surface.

[Claim 14] 14. The radial shaft seal according to claim 1, wherein the sealing lip is prestressed by a spring force in a direction toward the rotary machine part.

[Claim 15] 15. The radial shaft seal according to claim 1, wherein the at least one of the first conical surface and the second conical surface has a wave-shaped profile in a circumferential direction of the sealing ring.

[Claim 16] 16. The radial shaft seal according to claim 15, further comprising a support ring against which support ring the sealing ring rests, wherein the support ring is arranged on a side of the sealing ring facing the surrounding atmosphere, wherein the wave-shaped profile is generated by an appropriate shaping of the support ring.